

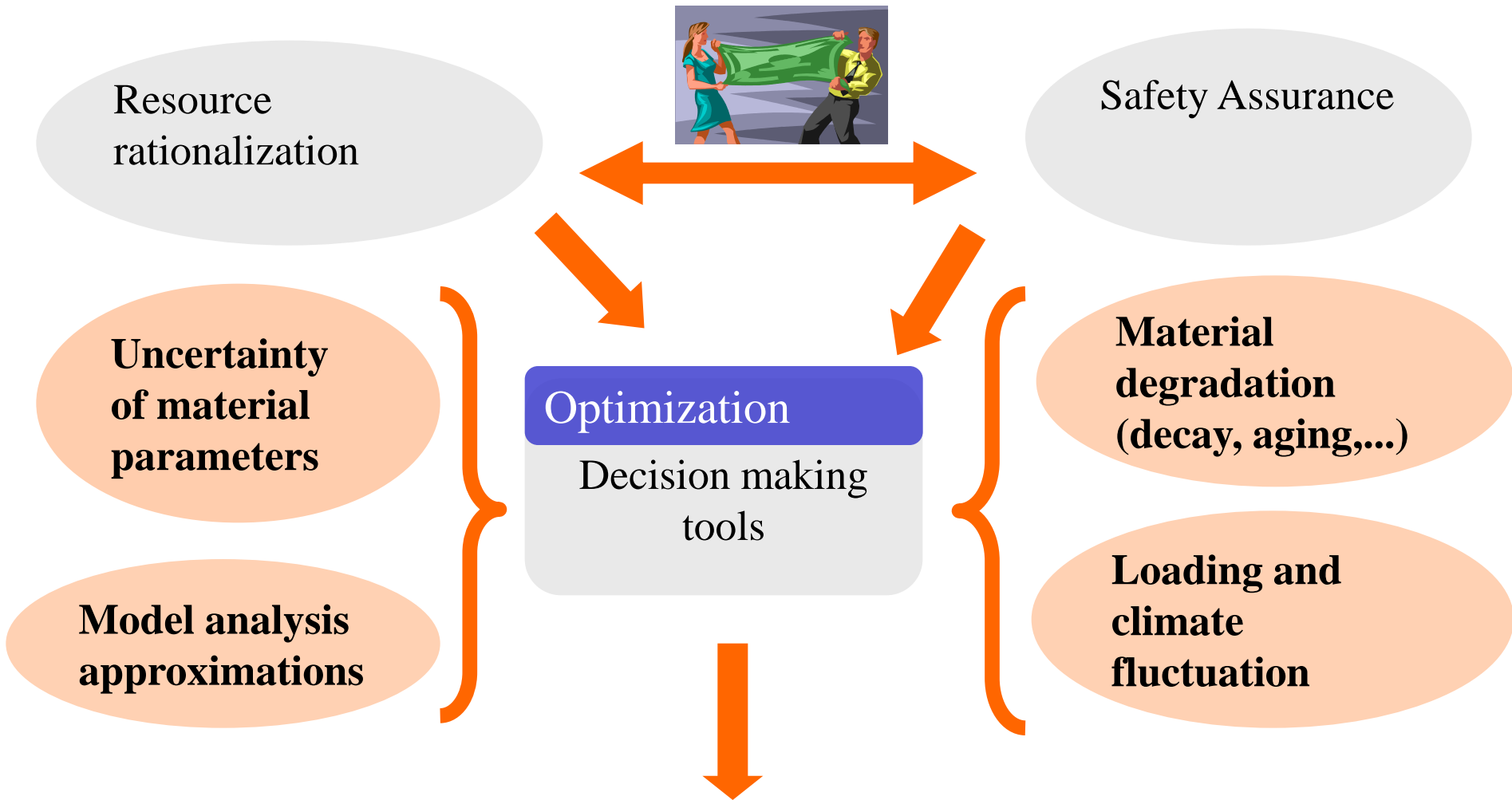
Reliability-based Design optimization of timber trusses subjected to decay and climate variations

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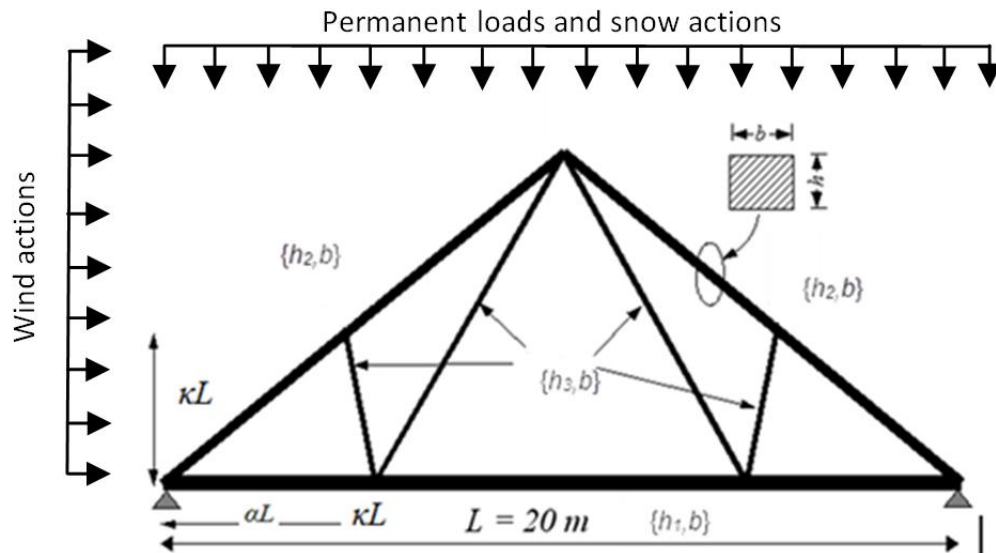
Context of the study



Reliability-Based Design Optimization offers a suitable framework for the consideration of the uncertainties in the design optimization and to find the best compromise between cost reduction and safety assurance.

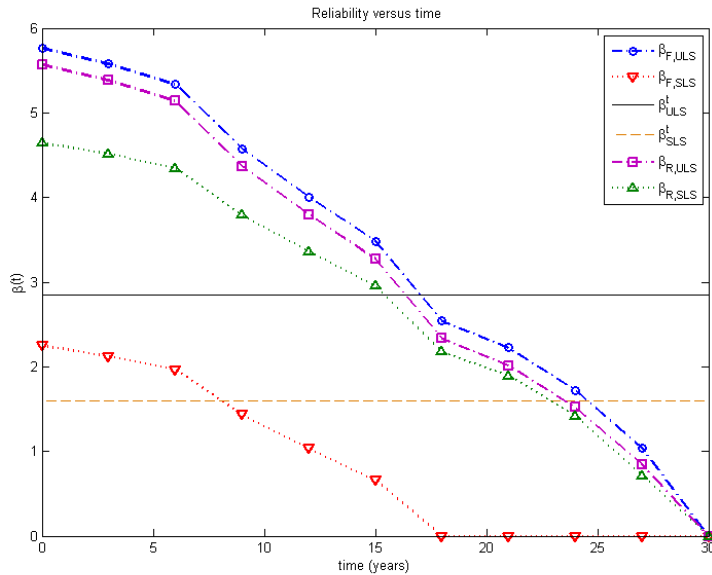
Context of the study

- Use of wood-based materials in sustainable constructions aims to reduce the environmental impact of buildings.
- Take into account **uncertainties** in material properties and actions and increase the structural reliability of timber trusses **subjected to decay**.
- Optimal Calibration of the **partial safety factors** to ensure the **best compromise** between cost reduction and safety assurance.

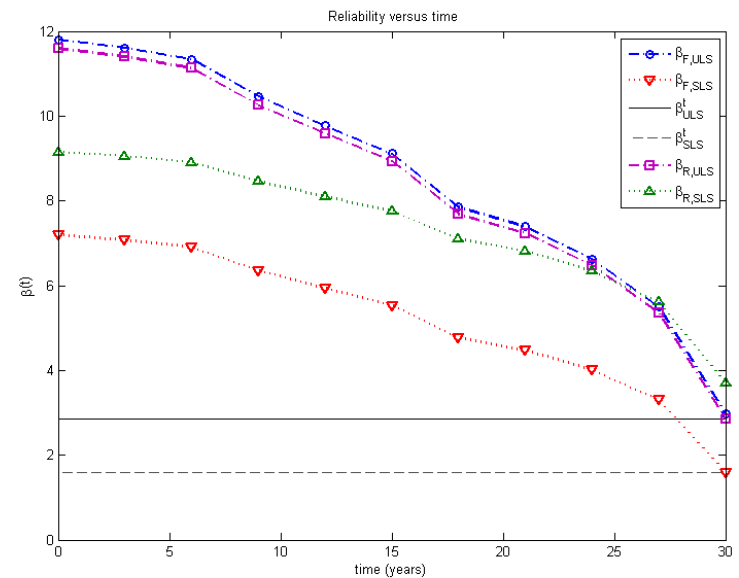


Main results

- ❑ The partial safety factors introduced in the deterministic design are assumed to take account for uncertainties related to timber material, structural dimension and loading. However, These safety factors are not calibrated to take into account decay degradation and are not directly linked to uncertainties.
- ❑ The use of the Reliability-Based Design Optimization to search the optimal design that minimizes the structural cost and to ensure a target reliability level during the operational life.



Time dependent reliability index of DDO



Time dependent reliability index of RBDO solution